COMPOSITIONS AND METHODS FOR PROTECTION OF ACTIVE METAL ANODES AND POLYMER ELECTROLYTES

ABSTRACT OF THE DISCLOSURE

Electrochemical structures with a protective interlayer for prevention of deleterious reactions between an active metal electrode and polymer electrolytes, and methods for their fabrication. The structures may be incorporated in battery cells. The interlayer is capable of protecting an active metal anode and a polymer electrolyte from deleterious reaction with one another while providing a high level of ionic conductivity to enhance performance of a battery cell in which the structure is incorporated. The interlayer has a high ionic conductivity, at least 10^{-7}S/cm, generally at least 10^{-6}S/cm, and as high as 10^{-3}S/cm or higher. The interlayer may be composed, in whole or in part, of active metal nitrides, active metal phosphides or active metal halides. These materials may be applied preformed, or they may be formed *in situ* by conversion of applied precursors on contact with the active metal anode material.